Topic overview

- Background
  Starry stonewort *Nitellopsis obtusa*, biology/history
  Big Turtle Lake

- Initial Discovery

- Response Strategy

- Partnerships
  Roles and Responsibilities

- Treatment Plan

- Challenges

- Future Actions
Starry stonewort
*Nitellopsis obtusa*

**Biology:**
- Native to Europe and Asia
- Large, grass-like form of algae
  - Characeae family
- Dioecous-only male starry stonewort present in US
  - No seeds are produced

**Identification:**
- Branchlets of 5-8 whorls, each with 1-2 long bract cells
- Appearance of the branchlet being forked
- White, star-shaped bulbils
Starry stonewort
*Nitellopsis obtusa*

Means of Spread:
- Unintentional transfer of bulbils and/or fragments

Impacts:
- Dense mats, at water surface
- Interfere with recreational activities
- May displace native vegetation
- Potential to impact fishing habitat

History:
- First found in US 1978 (1974)
- MI for over a decade
- WI in 2014
- Found in MN 2015
Big Turtle Lake, Beltrami County
Initial Discovery
August 5, 2016

- Initial discovery of SSW by Beltrami County staff and reported to MN DNR
- Verification received by Dr. Ken Karol of the New York Botanical Garden same day
- 185 miles away from the first known SSW infestation in Minnesota
- Importance of Early Detection Programs
Response

- Aug 8th - Lake-wide search
- Partners identified
- Aug 10th - Designation of infested waters
- Inspection hours increased to staff 7 days/week incl decon
- Treatment options researched
- Aug 15th - Public meeting held by TRWA
- An aggressive response and approach was favored
  Heavily used access and popular fishing lake
- Continued SSW inspection around the county
Partnerships

Contractors:
Roles and Responsibilities

- MNDNR- EWR, FAW, PAT, LAM, lead on funding and staff to implement project, inspectors
- Beltrami County- inspectors, disposal site, continued SSW inspections, continued education and outreach
- Turtle River Watershed Association and members-valuable connection to the members of the watershed, continued education and outreach, avenue to bring stakeholders together, increase of public support for the project
- Kohl’s Resort- key in the closure of the public access to prevent spread of SSW in Turtle and to other waterbodies
Access closure was discussed, options pursued

Aug 18th-Containment barriers first installed around the bulk of the biomass
More extensive survey of the area to determine boundary

Aug 25th-Boating lane and dock removed

Aug 26th-0.75 acre treatment plot enclosed

Aug 26th-Access officially closed after temporary lease signed with Kohl’s Resort
Treatment Plan

- Contain the infestation to the known area
- Remove as much biomass and sediment as possible (removal of settled bulbils)
  
  DASH and Aqua Vac harvester options
  
  Dewater on site and dispose of spoil off site in approved location
- Follow up with copper sulfate treatment
- Monitor results post treatment (pre treatment sampling points established)
- Follow up with future actions dependent on monitoring results
Treatment Plan
Suction Harvesting

- Bids requested/received, contract was granted to Aquatic Restoration Services to Aqua Vac the 0.75 acre treatment plot
- Dewatering bags had to be ordered and shipped
- Aug 27th-Contractor mobilized and pre-con mtg held
- Aug 28th-Suction harvesting commenced (expected 3-5 days to complete)
Treatment Plan
Suction Harvesting
Treatment Plan
Cu Application

- Sep 5\textsuperscript{th}-Suction harvesting completed
  Equipment experienced mechanical difficulties
- Equipment decontaminated before leaving site
- Sep 6\textsuperscript{th}-Copper sulfate applied by PLM
- Sep 9\textsuperscript{th}-Silt curtain removed and access reopened
Adaptive Treatment Plan

- Sep 9\textsuperscript{th}-Post treatment monitoring conducted
- Approximate 90\% reduction in biomass and some bulbils remain (visual estimation)
- Suction harvesting limitations in near shore shallow areas left SSW
  
  Those areas are still contained and excavation bids are being considered
- Sep 29\textsuperscript{th}-Additional copper treatment with Komeen/flumioxazin combo to potentially impact remaining bulbils
Post treatment actions

- Disposal site at inactive Beltrami Co. gravel pit
- Sep 27th-Dewatering bag and contents hauled to the disposal site
- 405 estimated tons of sediment and plant matter removed
- Silt curtains moved to off-site location for decontamination
Challenges

- Past research on SSW is limited. Much is unknown about this species.
- Suction harvesting can be costly and may be best used in combination with other treatment methods, limitations.
  - Not a complete removal of all SSW biomass.
- Chemical applications have different effects in different systems on different specimens.
- Much is unknown about the efficacy of different chemical formulations on SSW or the bulbils.
Future Actions

- Determine need and timing of any additional chemical applications in future years
- Monitor regrowth of SSW
- Monitor native plant reestablishment
- Continue SSW inspections in other waters
- Collaborate with MAISRC and other partners on research projects to expand our knowledge of SSW and their bulbils

Red Lk, Cass Lk, Moose Lk (R1), Lk Winni (R2), Lk Koronis, Mud Lk, Rice Lk, W Sylvia (R3)
Updates

- Oct 10th - Post Komeen/flumioxazin application monitoring conducted
- No observed physical effect on bulbils (i.e., no apparent discoloration or damage)
- Oct 24th - Shoreline areas are to be excavated to remove biomass remaining as a result of Aqua Vac limitations
Questions?

Thank you for your attention!

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